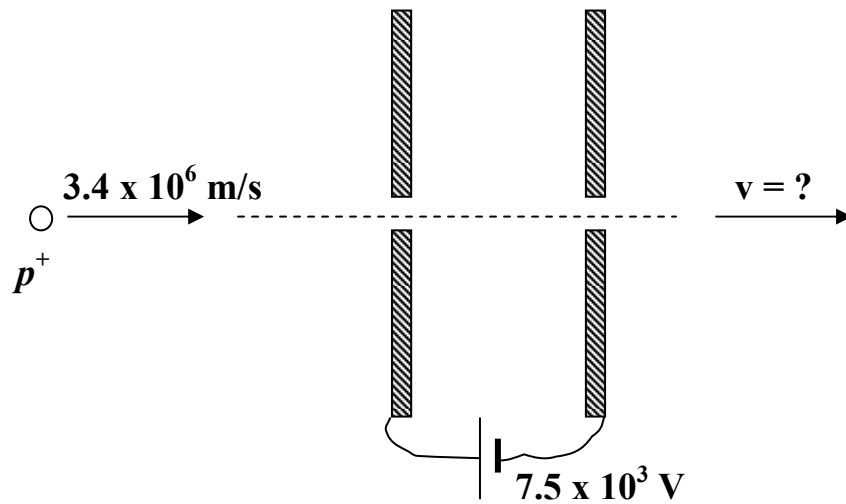


Example 14. A proton travelling at 3.4×10^6 m/s passes through an electric field as shown below. How fast will the proton be going after it emerges from the field?



This is a conservation of energy problem:

$$\Delta E_p = \Delta E_k$$

$$q\Delta V = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2 = \frac{1}{2}m(v_f^2 - v_i^2)$$

$$(1.6 \times 10^{-19})(7500) = \frac{1}{2}(1.67 \times 10^{-27})[v_f^2 - (3.4 \times 10^6)^2]$$

$$v_f = 3.6 \times 10^6 \text{ m/s}$$